smartLAB® indi

Fully automatic wrist-cuff blood pressure monitor

User Manual

Please read this user manual thoroughly before first using the blood-pressure monitor.

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I. Introduction

Thank you for using the **smartLAB®*indi*** wrist-cuff blood pressure monitor. With this device you can easily control your blood-pressure values and pulse rate and store the measured data. With its colored Bi-Classification LEDs, all results on the meter can be classified according to their value. Please read this manual thoroughly, before first using your **smartLAB®*indi*** wrist-cuff blood pressure monitor.

Normal blood pressure fluctuation

All physical activity, excitement, stress, eating, drinking, smoking and many other activities or factors (including taking a blood pressure measurement) will influence blood pressure value. Because of this, it is mostly unusual to obtain identical multiple blood pressure readings.

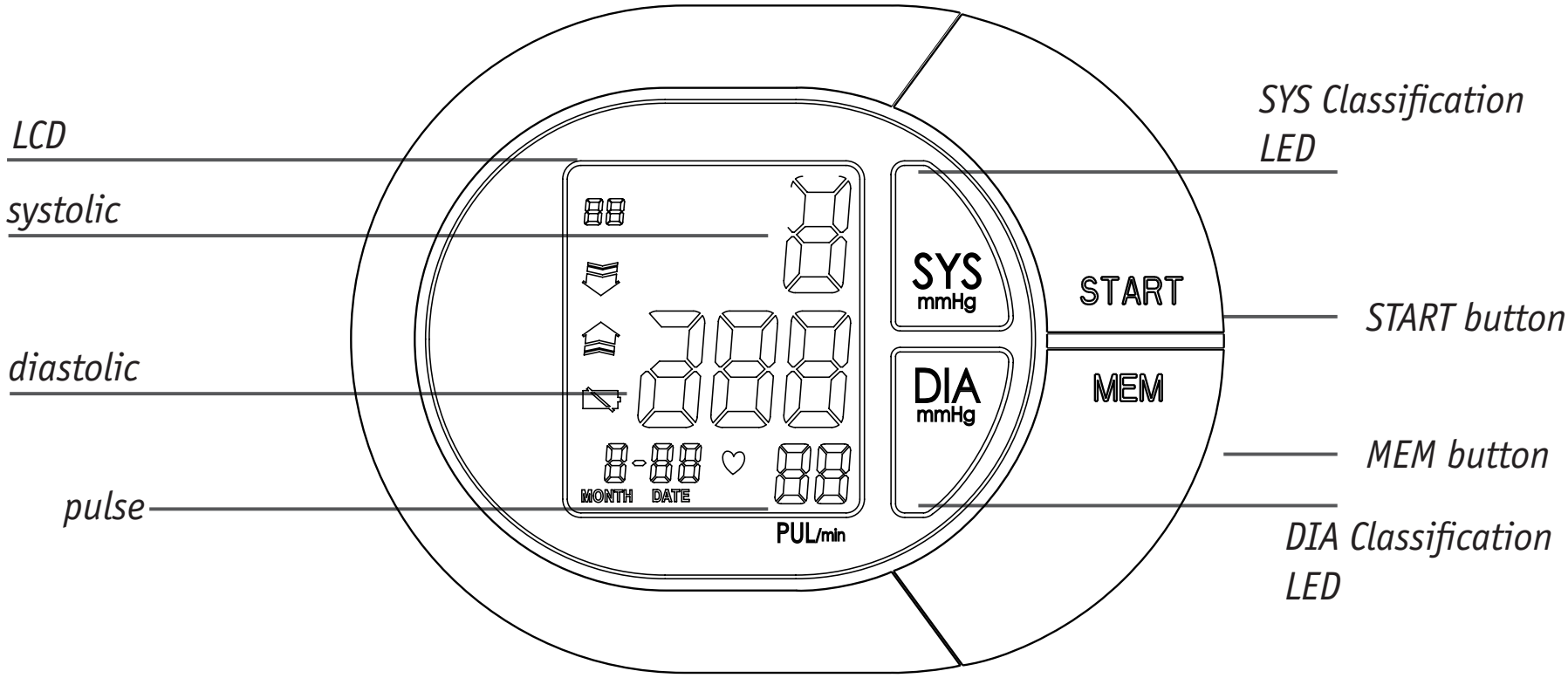
Blood pressure fluctuates continually — day and night. The highest value usually appears in the daytime and lowest one usually at midnight. Typically, the value begins to increase at around 3:00AM, and reaches to highest level in the daytime while most people are awake and active.

Considering the above information, it is recommended that you measure your blood pressure at approximately the same time each day.

Please always relax a minimum of 3 to 5 minutes between measurements to allow the blood circulation in your arm to recover. It is rare that you obtain identical blood pressure readings each time.

II. Your smartLAB® *indi*

Display & functions



Set Contents

1 smartLAB®*indi* Blood Pressure Monitor
1 User Manual
1 smartLAB® Plastic Box
2 „AAA“ batteries

Product description

Based on oscillometric method and silicon integrate pressure sensor technology, blood pressure and heart rate can be measured automatically and non-invasively. The LCD display will show blood pressure, pulse rate and irregular heart beat (if any). The most recent 60 measurements can be stored in the memory with date and time stamp. Systolic and Diastolic be classified for your blood pressure respective.

Specifications

1. *Model:* smartLAB® *indi*
2. *Classification: Internally powered, type B*
3. *Device size: 83 mm x 65.6mm x 32.2mm*
4. *Cuff size: 300 mm x 70mm*
5. *Weight: 130 g (ohne Batterien)*
6. *Measuring method: oscillometric, automatic air inflation and measurement*
7. *Memory volume: 60 values with date and time*
8. *Batteries: 2xAAA*
9. *Blood pressure measuring range: 0-295mmHg*
10. *Measuring accuracy: ±3mmHg*
11. *Heart / Pulse rate range: 40-180/min*
12. *Environmental temperature for using: 5 °C-40 °C*
13. *Environmental humidity for using: 90%*
14. *Environmental temperature for storage: -20 °C ~55 °C*
15. *Environmental humidity for storage: ~ 95%*
16. *Environmental pressure: atmosphere pressure*
17. *Battery life: Approx.1 months with 3-min. usage per day*

Note:

1. Stay quite, calm and rest for 5 minutes before blood pressure measurement.
2. The cuff should be placed at the same level as your heart.
3. During measurement, neither speak nor move your body and arm.
4. Measuring on same wrist for each measurement.
5. Please always relax a minimum of 3 to 5 minutes between measurement to allow the blood circulation in your arm to recover.
6. Remove the batteries if the monitor will not be used for a month or more to avoid damage of battery leakage.
7. This blood pressure monitor is designed for adults and should never be used on infants or young children. Consult your physician or other health care professionals before use on older children.
8. Blood pressure measurements determined by this monitor are equivalent to those obtained by a trained observer using the cuff/ stethoscope auscultation method, within the limits prescribed by the American National Standard, Electronic or automated sphygmomanometers.
9. Please avoid strong magnetism interference, such as mobile telephone,

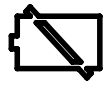
microwave oven, etc.

10. If Irregular Heartbeat (IHB) brought by common arrhythmias is detected in the procedure of blood pressure measurement, this signal will be displayed:
    Under this condition, the **smartLAB®*indi*** can keep function, but the results may not be accurate, it's suggested that you consult with your physician for accurate assessment.

III. Setup & Operating procedures

Battery loading

- Open battery cover at the back of the monitor.
- Load two “AAA” size batteries. Please pay attention to polarity.
- Close the battery cover.

⚠ When LCD shows battery symbol  replace all batteries with new ones.

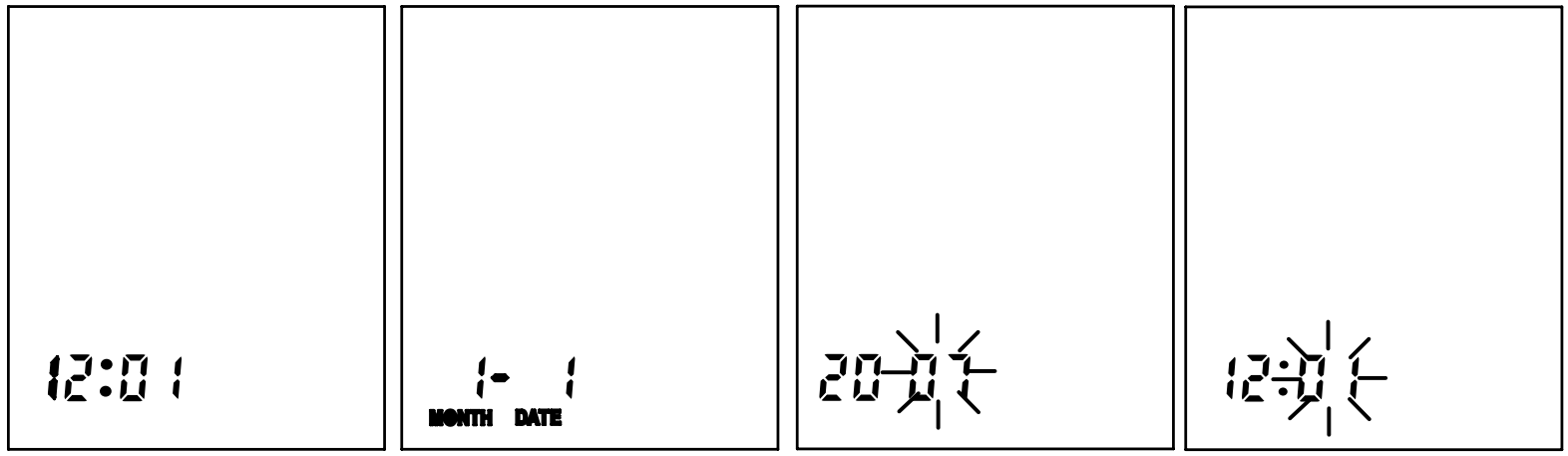
⚠ Rechargeable batteries with a voltage of 1.2V are not suitable for this monitor

⚠ Remove the batteries if the monitor will not be used for a month or more to avoid relevant damage of battery leakage

The monitor, the batteries and the cuff, must be disposed of according to local regulations at the end of their usage.

Clock Mode

Once you install the battery, two “beep” later, the LCD will display the time and date by turns.



Clock Adjusting

- When the **smartLAB®*indi*** is in Clock Mode, press the START and MEM button at the same time, the machine enters Manual Clock Adjusting mode, the number of year will twinkle first. Press START button continuously, the numbers of month, date, hour and minute will twinkle in turn. While the number is twinkling, press MEM button to increase the corresponding number. Keep on pressing the button “MEM”, the number will increase fast.
- You can turn off your **smartLAB®*indi*** by pressing “START” button when

the minute is twinkling, then the time and date is confirmed.

- Your **smartLAB®*indi*** will turn off automatically after 1 minute of no operation with the time and date unchanged.

- Once you change the batteries, you will have to readjust clock.

Connecting the cuff to the monitor

The cuff is attached to your **smartLAB®*indi*** when it is packaged. Should the cuff become unattached, align the two plugs and four brackets of the cuff with the plug sockets and bracket sockets of the monitor and press the cuff to the monitor until the plugs and brackets are securely attached.

Applying the cuff

Place the cuff around a bare wrist 1-2cm above the wrist joint on the palm side of the wrist.

- While seated, place the arm with the cuffed wrist in front of your body on a desk or table with the palm up. If the cuff is correctly placed, you can read the LCD display.
- The cuff must be neither too tight nor too loose. You should be able to insert one finger between the cuff and your wrist.

Note:

- Measuring on same wrist each time.
- Do not move your arm, body, or the monitor and do not move the rubber tube during measurement.
- Stay quite, calm for 5 minutes before blood pressure measurement.
- If the cuff becomes dirty, remove it from the monitor and clear it by hand in a mild detergent, then rinse it thoroughly in cold water. Never dry the cuff in clothes dryer or iron it.

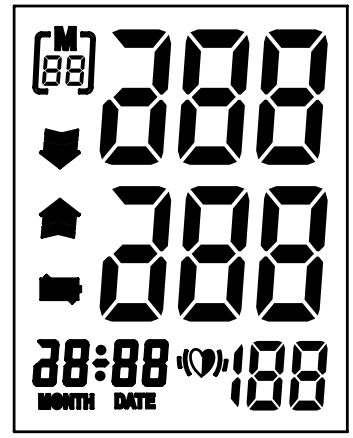
Body posture during measurement

Sitting Measurement – Recommended Position

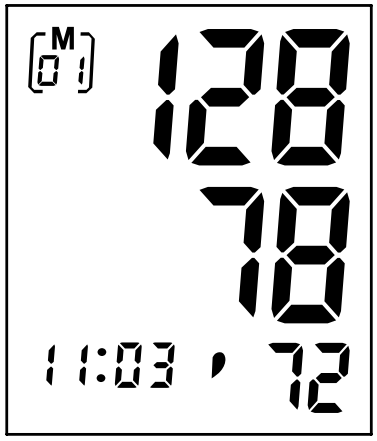
- Sit upright
- Place palm upside in front of you on a flat surface such as a desk or table, with your elbow resting on a chair or table
- The cuff should be at the same level as your heart.
- Place your arm on the monitor's plastic case to aid maintaining a correct and still arm position.

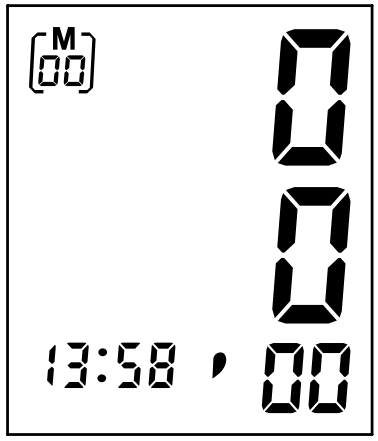
Measuring Process

- After applying the cuff and your body is in a comfortable position, press the "START" button. After a long "beep", your **smartLAB**®***indi*** will verify itself, and LCD will twinkle automatically, and the Bi-classification LED will lighten.

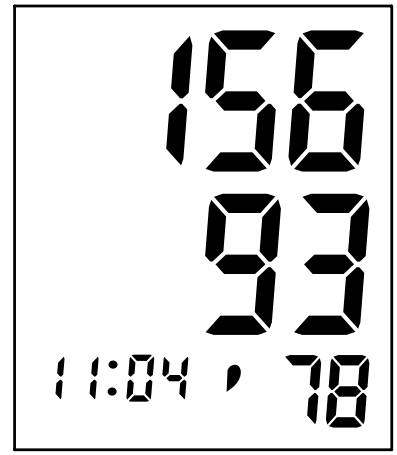


- If it already has memory, LCD will show the latest result. If your **smartLAB®*indi*** has not stored any memory, the LCD will show six “0”. The Bi-classification LED will lighten with the colour that indicates the blood pressure classification of the result.





- Then your **smartLAB®*indi*** inflates the cuff until sufficient pressure has built up for a measurement. Then the monitor slowly releases air from the cuff and carries out the measurement. Finally the blood pressure and pulse rate will be calculated and displayed on the LCD screen. The irregular heartbeat symbol (if any) and blood pressure classification indicator will twinkle.
The result will be automatically stored.

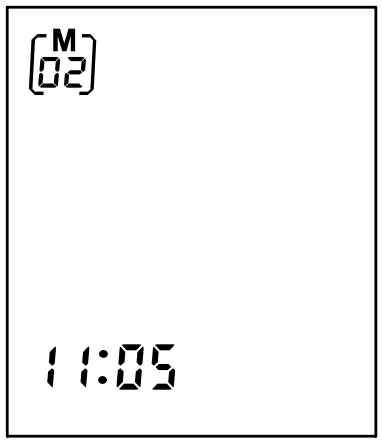


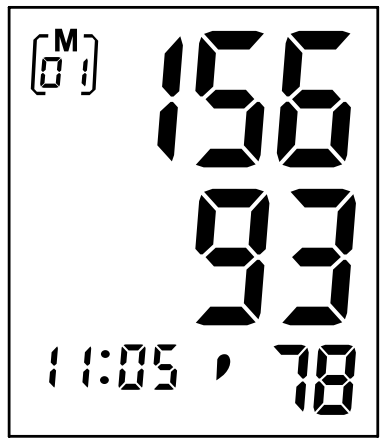
- After measurement, your **smartLAB®*indi*** will turn off automatically after 1 minute of no operation. Alternatively, you can press the “START” button to turn off the monitor manually.
- During measurement, you can press the “START” button to turn off the monitor manually.

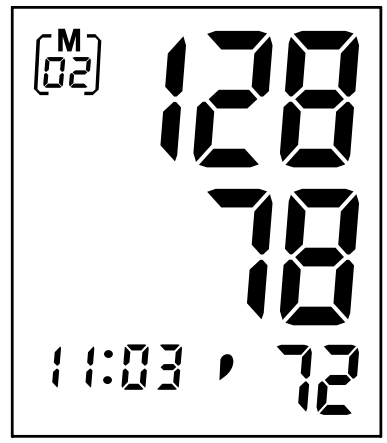
Displaying stored results

- In clock mode, press “MEM” button to display the stored results. LCD will show the amount of results.

- A few seconds later the latest result will be displayed, which is 01 for memory number. It has irregular heartbeat indication (if any) and the indication of blood pressure classification. The time of the measurement will also be displayed. Continuously press the “MEM” button, to scroll through the stored values



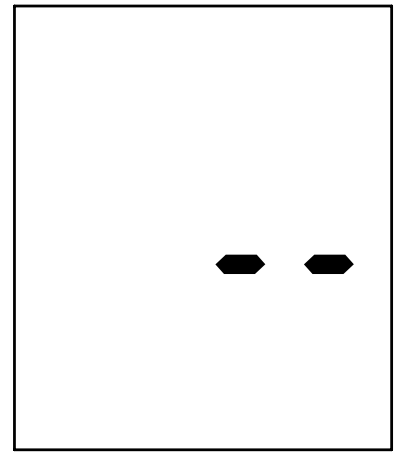


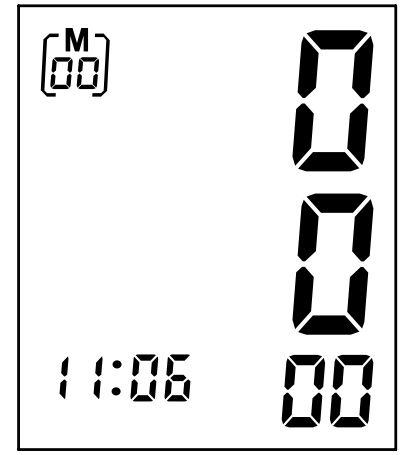


- The Bi-classification LED will also indicate the blood pressure classification.
- Press “MEM” button again after the last memory, the monitor will power off. In the reviewing mode, it will automatically power off after 1 minute of no use. Alternatively, you can press the “START” button to shut down the **smartLAB®*indi***.
- If no memory is stored (or all memories have been deleted), the LCD will show “0” for systolic, diastolic and “00”for the numbers of memory, heart rate. By pressing the “MEM” or “START”, the monitor will power off.

Erasing results

When any result is displayed, keep on pressing button “MEM” for three seconds, and all results in current memory bank



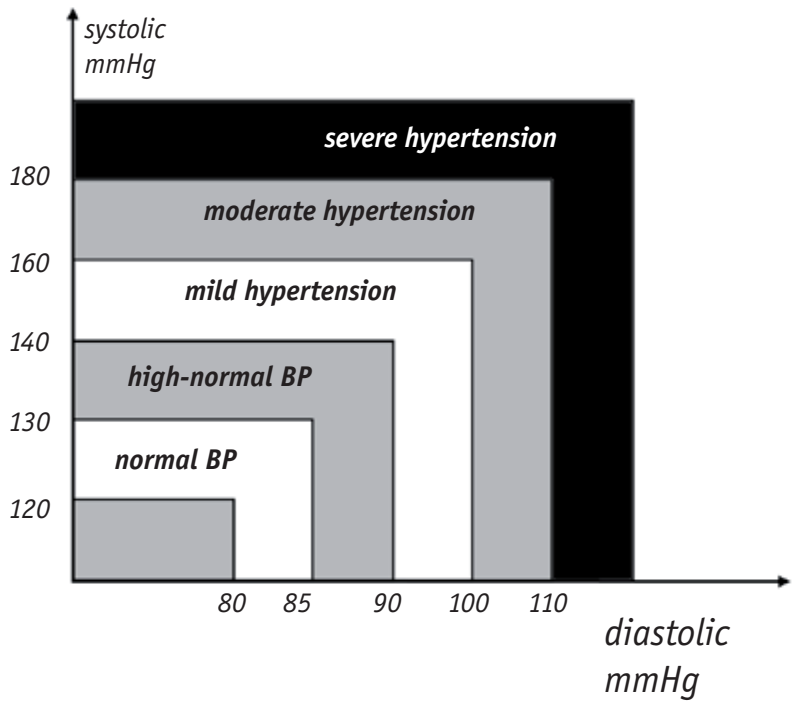


will be deleted after three “beep”. By pressing the button “MEM” or “START”, the monitor will turn off.

IV. Miscellaneous

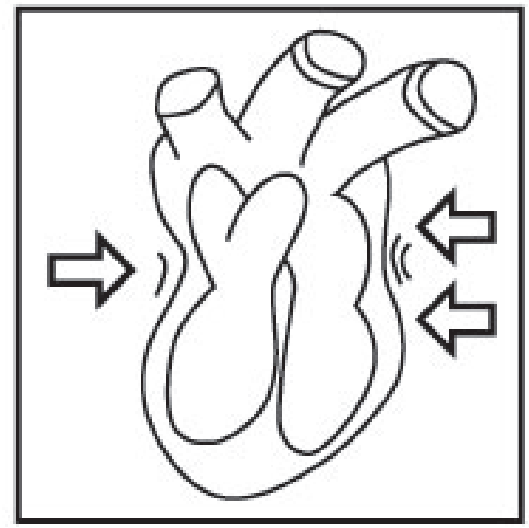
Assessing high blood pressure for adults

The following guidelines for assessing high blood pressure (without regard to age or gender) have been established by the World Health Organization (WHO). Please note that other factors (e.g. diabetes, obesity, smoking, etc.) need to be taken into consideration. Consult your physician for accurate assessment.



Knowledge on Blood Pressure:

Your heart is just like a pump which causes the blood to circulate through all vessels. As a result, the blood pressure is the pressure on the wall of the blood vessel pressed by blood. The output of blood from the heart when it is a systole is called systolic pressure. The blood returning to the heart when it is a diastole is called diastolic pressure.



Blood pressure fluctuates continually — day and night. The highest value usually appears in the daytime and lowest one usually at midnight. Typically, the value begins to increase at around 3:00AM, and reaches to highest level in the daytime while most people are awake and active.

For this reason it is recommended to measure your blood pressure each day at the same time.

OPERATION BODY & CIRCUMSTANCES

Reason		sytolic pressure		diastolic pressure	
		high	low	high	low
Drinking, smoking		●		●	
Excitement or sporting		●		●	
seeing a doctor, desire to urinate		●		●	
change of temperature	high	●		●	
	low	●		●	
After bathing, deep breathing or yawning		●		●	
Cuff placing	tight		●		●
	loose		●		●
Cuff position	above the heart		●		●
	below the heart	●			●

The blood pressure is influenced by a variety of different factors, such as bodily circumstances or a wrong operation of the monitor. Some people even get nervous when seeing a doctor and that will make their blood pressure rise.

Single measurements can not indicate the whole blood level, so you need not to be anxious for isolated higher or lower blood pressure results. The most important thing is to master one‘s blood pressure trend through long-term measurement. Please talk to your doctor for useful judgement of your recorded values.

Average values of normal arterial blood pressure (mmHg):

The following chart shows usual average values. You could obtain similar results by measuring your blood pressure for several days at the same time. (so called „Basic Blood Pressure“)

Age	Male		Female	
	systolic	diastolic	systolic	diastolic
11-15	114	72	109	70
16-20	115	73	110	70
21-25	115	73	110	71
26-30	115	75	112	73
31-35	117	76	114	74
36-40	120	80	116	77
41-45	124	81	122	78
46-50	128	82	128	79
51-55	134	84	134	80
56-60	137	84	139	82
61-65	148	86	145	83

Hypertension:

Various cardiovascular or kidney diseases can cause hypertension. Long-term hypertension can also cause pathological changes in heart, brain and kidney. These changes can lead to hypertension complications which are often diagnosed or treated too late.

Low Blood Pressure:

There are two kinds of minimum pressure:

- If you always feel dizzy, unsuitable in the chest and have difficulties in breathing or occurences of temporary myopia when standing up, you might have a standing minimum pressure disease. You should go to see a doctor.

- The original minimum pressure disease has no self-symptoms (besides low blood pressure). To get rid of it, you should pay more attention to nutrition and do more physical exercise.

BD Classification	*SBP mmHg*	*DBP mmHg*	*Color indicator*	*Color changing area*
Optimal	*< 120*	*< 80*	*GREEN*	*GREEN*
Normal	*120-129*	*80-84*	*GREEN*	*GREEN*
High-	*130-139*	*85-89*	*GREEN*	*GREEN*
Stage 1 Hypertension	*140-159*	*90-99*	*YELLOW*	*YELLOW*
Stage 2 Hypertension	*160-179*	*100-109*	*ORANGE*	*RED*
Stage 3 Hypertension	*≥180*	*≥110*	*RED*	*RED*

Note: It is not intended to provide a basis of any type of rush toward emergency conditions/diagnosis based on the color scheme. This color scheme is only meant to discriminate between the different levels of blood pressure.

Additionally, the Bi-classification LED will display the corresponding colour respective for the Systolic and the Diastolic.

Example: if the systolic value is 161 (which is Stage 2 Hypertension), the LED for the Systolic (which is upper) should display red. And if the diastolic value is 89 (which is High-normal), the LED for the Diastolic (which is lower) should display green.

Troubleshooting

Problem	***Cause***	***Remedy***
LCD shows low battery symbol	*Battery power low*	*exchange batteries*
LCD shows „Er 0“	*Pressure system is instable before measurement*	*Don‘t move and try again*
LCD shows „Er 1“	*Systolic pressure detect fail*	
LCD shows „Er 2“	*Diastolic pressure detect fail*	

Problem	*Cause*	*Remedy*
LCD shows „Er 3“	*Pneumatic system is blocked or cuff is too tight during inflation*	*Place the cuff correctly and try again*
LCD shows „Er 4“	*Pneumatic system leak or cuff is too loose during inflation*	
LCD shows „Er 5“	*Inflation above 300mmHg*	*Measure again after 5 minutes. If the monitor is still abnormal, please contact the local distributor / manufacturer.*
LCD shows „Er 6“	*Over 3 minutes while pressure above 15 mmHg*	
LCD shows „Er7“	*EEPROM accessing error*	
LCD twinkling	*Device parameter check error*	
LCD shows „Er 9“	*MCU self-verity error*	
LCD shows „Er A“	*Span error*	
LCD shows „Er b“	*EEPROM Backup-error*	
No response when you press any button. BPM hang	*Incorrect operation*	*Take out batteries for a while, and then reinstall all batteries.*

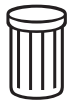
Maintenance

1. Do not drop this monitor or subject it to strong impact.
2. Avoid high temperature and solarization. Do not immerse the monitor in water as this will result in damage to the monitor.
3. If this monitor is stored near freezing, allow it to acclimate to room temperature before use.
4. Do not attempt to disassemble this monitor.
5. If you do not use the monitor for a long time, please remove the batteries.
6. It is recommended to check the monitor performance every 2 years or after repair.

Explanation of Symbols

Caution! Please red user manual thoroughly!

Type-B Applied Parts



Disposal Information

Warranty

HMM Diagnostics GmbH products need to fulfill high quality requirements. Because of this reason, HMM Diagnostics GmbH gives a 2-year warranty by purchasing this **smartLAB**® product. You can even extend the warranty from 2 to 5 years without extra pay when you register your product. Please use the warranty card included in your product set.

Wear parts, batteries etc. are excluded from warranty.

Manufacturer:

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Weitere Informationen zu den smartLAB® Produkten /
More information on our smartLAB® products:

www.smartlab.org